AMENDMENTS
In the Claims

Current Status of Claims

1.(**original**) A composition comprising brine solution including an effective amount of a divalent cation, at least one pollutant and having a salinity between about 3% and about 15%, where the effective amount of the divalent cation is sufficient to produce a divalent to monovalent cation mole ratio of at least 0.05 in the brine solution and where the brine solution is capable of supporting and sustaining growth of a microbial culture capable of degrading the at least one pollutant.

2.(**original**) The composition of claim 1, wherein the divalent cation is selected from the group consisting of Mg^{2+}, Ca^{2+}, Sr^{2+}, Ba^{2+}, and mixtures or combinations thereof.

3.(**original**) The composition of claim 1, wherein the divalent cation is selected from the group consisting of Mg^{2+}, Ca^{2+}, Sr^{2+}, and mixtures or combinations thereof.

4.(**original**) The composition of claim 1, wherein the divalent cation is selected from the group consisting of Mg^{2+}, Ca^{2+}, and mixtures or combinations thereof.

5.(**original**) The composition of claim 1, wherein the divalent cation is Mg^{2+}.

6.(**original**) A brine solution comprising a divalent to monovalent cation mole ratio of at least 0.05 and having a salinity greater than or equal to about 3%, where the brine solution is capable of supporting and sustaining microbial growth.

7.(**original**) The composition of claim 6, wherein the divalent cation is selected from the group consisting of Mg^{2+}, Ca^{2+}, Sr^{2+}, Ba^{2+}, and mixtures or combinations thereof.

8.(**original**) The composition of claim 6, wherein the divalent cation is selected from the group consisting of Mg^{2+}, Ca^{2+}, Sr^{2+}, and mixtures or combinations thereof.

9.(**original**) The composition of claim 6, wherein the divalent cation is selected from the group

consisting of Mg^{2+}, Ca^{2+}, and mixtures or combinations thereof.

10.(**original**) The composition of claim 6, wherein the divalent cation is Mg^{2+}.

11.(**original**) The composition of claim 6, wherein the brine solution has a salinity between about 3% and about 15%.

12.(**original**) The composition of claim 6, wherein the brine solution has a salinity between about 3% and about 13%.

13.(**original**) The composition of claim 6, wherein the brine solution has a salinity between about 3% and about 10%.

14.(**original**) A method comprising the steps of:

feeding a contaminated brine solution to a biological reactor containing a mixed bacterial culture capable of degrading at least one contaminant under anoxic/anaerobic conditions;

adding an effective amount of a divalent cation precursor to the reactor, where the effective amount of the divalent precursor is sufficient to maintain a divalent to monovalent cation mole ratio at a numeric value greater than or equal to about 0.05,

degrading the contaminant in the contaminated brine solution for a time and at a temperature sufficient to reduce a concentration of the contaminant at or below a desired concentration while maintaining a suitable nutrient environment in the reactor and while maintaining the ratio greater than or equal to about 0.05.

15.(**original**) The method of claim 14, wherein the reactor is sealed to reduce or eliminate oxygen from the reactor.

16.(**original**) The method of claim 14, further comprising the step of:

sparging or purging the reactor with an oxygen-free gas after feeding the brine solution and optionally during the degrading step.

17.(**original**) The method of claim 14, wherein the gas is selected from the group of nitrogen, argon, and mixtures and combinations thereof.

18.(**original**) The method of claim 14, wherein the divalent cation precursor is selected from the group consisting of a soluble Mg^{2+} salt, a soluble Ca^{2+} salt, a soluble Sr^{2+}, a soluble Ba^{2+} salt, and mixtures or combinations thereof.

19.(**original**) The method of claim 14, wherein the divalent cation precursor is selected from the group consisting of a soluble Mg^{2+} salt, a soluble Ca^{2+} salt, a soluble Sr^{2+}, and mixtures or combinations thereof.

20.(**original**) The method of claim 14, wherein the divalent cation precursor is selected from the group consisting of a soluble Mg^{2+} salt, a soluble Ca^{2+} salt, and mixtures or combinations thereof.

21.(**original**) The method of claim 14, wherein the divalent cation precursor is a soluble Mg^{2+} salt.

22.(**original**) The method of claim 14, wherein the contaminant is selected from the group consisting of perchlorate, nitrate and mixture or combinations thereof.

23.(**original**) The method of claim 22, wherein the nutrient environment comprises adding an inorganic energy source or an organic energy source in amounts greater than a stoichiometric amount of electrons required to reduce the perchlorate and/or nitrate present in the brine solution for sustained microbial growth during the degrading step.

24.(**original**) The method of claim 23, wherein the inorganic energy source is selected from the group consisting of H_2 gas, a hydrogen delivery chemical, and mixtures or combinations thereof.

25.(**original**) The method of claim 23, wherein the organic energy source is selected from the group consisting of acetate, ethanol, methanol, lactate, and mixtures or combinations thereof.

26.(**original**) The method of claim 14, wherein the contaminated brine solution is a perchlorate

and/or nitrate contaminated ion-exchange regenerate brine.

27.(**original**) A method comprising the steps of:

passing a waste water stream including at least one ion-exchangeable pollutant through an ion-exchange resin able of exchanging the pollutant ion for a non-pollutant ion for a predetermined time or until the resin is no longer to exchange the pollutant ion with the non-pollutant ion;

stopping the waste water stream from passing through the resin;

passing a brine solution through the resin for a time sufficient to exchange all or substantially all of the pollutant ion with the non-pollutant ion to form a pollutant contaminated brine solution;

adding an effective amount of a divalent cation to the pollutant contaminated brine solution to adjust a divalent to monovalent cation mole ratio to a numeric value greater than or equal to 0.05 to form a stabilized, pollutant contaminated brine solution;

contacting the stabilized, pollutant contaminated brine solution with an effective amount of a pollutant degrading culture under anaerobic/anoxic conditions for a time and at a temperature sufficient to degrade a concentration of the pollutant to or below a desired concentration to form a crude treated brine solution; and

filtering the crude treated brine solution to remove the culture and to form a treated brine solution.

28.(**original**) The method of claim 27, further comprising the step of:

repeating the step of claim 26, where the brine solution comprises the treated brine solution.

29.(**original**) A method comprising the steps of:

feeding a waste water stream including at least one ion-exchangeable pollutant with a first column including a first ion-exchange resin able of exchanging the pollutant ion for a non-pollutant ion for a predetermined time or until the resin is no longer to exchange the pollutant ion with the non-pollutant ion;

switching the waste water stream feeding from the first column to a second column including a second ion-exchange resin capable of exchanging the pollutant ion for a non-pollutant ion for a predetermined time or until the resin is no longer to exchange the pollutant ion with the non-pollutant ion;

passing a brine solution through the first column for a time sufficient to exchange all or substantially all of the pollutant ion with the non-pollutant ion to form a pollutant contaminated brine solution and to regenerate the first resin;

adding an effective amount of a divalent cation to the pollutant contaminated brine solution to adjust a divalent to monovalent cation mole ratio to a numeric value greater than or equal to 0.05 to form a stabilized, pollutant contaminated brine solution;

contacting the stabilized, pollutant contaminated brine solution with an effective amount of a pollutant degrading culture under anaerobic/anoxic conditions for a time and at a temperature sufficient to degrade a concentration of the pollutant to or below a desired concentration to form a crude treated brine solution;

filtering the crude treated brine solution to remove the culture and to form a treated brine solution;

switching the waste water stream feeding from the second column to first column; and

repeating the above-identified steps.

30.(**original**) The method of claim 27, wherein the first and second ion-exchange resins are the same.